

ELECTRO-CHEMICAL ANALYSIS DEVICE WITH INTEGRATED  
THERMAL SENSOR AND METHOD FOR MONITORING  
A SAMPLE USING THE DEVICE

5

Abstract of the Disclosure

10 An electro-chemical analysis device and method for analyzing biomolecular samples, including a means for holding a sample on a substrate platform, a thermal sensor, a biosensor formed having a specific spatial resolution as related to the thermal sensor, and a means for providing radiation to the biomolecular sample. The means for holding the sample, the thermal sensor, the biosensor, and the means for providing radiation all three-dimensionally integrated with the substrate platform, thereby defining a compact biomolecular analysis device having a volume resolution of less than 15 50 micro liters. During operation, radiation is provided to the biomolecular sample to provide for a constant temperature at which hybridization of the biomolecules takes place. The temperature of the biomolecular sample is monitored and controlled by the integrated thermal sensor and the integrated heater. Once hybridization takes place, the change in electric condition (e.g. 20 voltage, current and/or power) is recorded and identification of the molecule within biomolecular sample is made by utilizing an exterior reader.